Claims

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A method for performing progressive data acquisition in a sensor web environment, comprising:

   using data from a first sensor, one or more surrounding sensors, and from a base station, whereby to attain optimal data acquisition of dynamic event where the location and time of such events cannot be anticipated.

2. The method of claim 1, wherein the utilization of data from surrounding sensors is done in an opportunistic way where no prior scheduling is performed.

3. A sensor subsystem for use in a system comprising one or more other similar sensor subsystems and a base processing system, the sensor subsystem comprising:

   a. Two or more data sources for gathering parameter data;

   b. A data summarizer which fuses parameter data gathered by two or more data sources to create an abstract data parameter;

   c. A progressive model, which takes as input abstract data parameters, and generates an output data model; and

   d. Means, which takes as input the output data model and derives an optimized schedule for

      i. (i) subsequent gathering of data by the sensor subsystem and

      ii. (ii) subsequent transmission of model data to the base processing station

   e. so as to maximize accuracy of a data model executed by the base station.

4. The sensor subsystem of claim 3, wherein the data sources include a data source on board the sensor subsystem, as well as a second sensor subsystem.

5. The subsystem of claim 3, wherein the data summarizer fuses data by using one or more of the following techniques: spatial interpolation, temporal extrapolation, and error concealment.

6. The subsystem of claim 3, wherein the input and output of the progressive model includes an uncertainty estimate.

7. A base processing system for use in a system comprising two or more sensor subsystems, the base processing system comprising:

a. Two or more data sources for gathering parameter data, at least one of the data sources being a sensor subsystem for generating model representing data gathered by two or more sensor subsystems;

b. A data summarizer which fuses parameter data gathered by the two or more data sources to create an abstract data parameter;

c. A progressive model which takes as input abstract data parameters and generates an output data model upon which a decision maker can base a decision.

8. The base processing system of claim 7, wherein the model generated by the sensor subsystem includes an uncertainty estimate.

9. A method, performed by a first remote sensor subsystem, for enabling the a first remote sensor subsystem to opportunistically collaborate with one or more other remote sensor subsystems in a system comprising two or more sensor subsystems and a base processing system, the method comprising:

a. Performing a model based processing of information collected by sensors located on board the first remote sensor subsystem;

b. Seeking out one or more neighboring remote sensor subsystems;

c. If there is a neighboring remote sensor subsystem, passing information to the neighboring remote sensor subsystem, and if not, transmitting the information to the base processing system.

10. The method of claim 9, wherein step b further comprises exchanging information with one or more neighboring remote sensor subsystems to determine the capabilities of such neighboring remote sensor subsystems.

11. The method of claim 9, wherein only information critical to collaborative processing is passed from the first remote sensor subsystem to the neighboring sensor subsystem.

12. The method of claim 9, wherein the first remote sensor subsystem stores critical information on board for future processing.